

Region 4 Everglades Survey Design 2013

Contact:

Peter I. Kalla, Ph.D., R-EMAP Coordinator
U.S. Environmental Protection Agency, Region 4
Science and Ecosystem Support Division
Ecological Assessment Branch
980 College Station Road
Athens, GA 30605-2720
Voice: 706-355-8778
Fax: 706-355-8726
Email: kalla.peter@epa.gov

Description of Sample Design

Target population: Florida Everglades marsh region in L

Sample Frame: Sample frame provided by Don Norris, EPA Region 4 (shapefile: 2013_Study_Area). List of stations sampled in 2005 provided by Pete Kalla (stations final 42005_s_to_n500 cross-walk w-oversamp.xls).

Survey Design: A Generalized Random Tessellation Stratified (GRTS) survey design for an area resource was used to select new sites. GRTS design for finite resource was used to select subset of 2005 sites for revisiting in 2013.

Multi-density categories: None.

Stratification: Stratify by each of the four areas: Loxahatchee, WCA 2A, WCA 3A, and Everglades National Park.

Panels: Base sample plus an over sample. For new sites a Fall and Spring panel was provided, although only the Fall panel is currently planned to be sampled.

Expected sample size: Base sample of 63 new sites and 62 revisit sites from 2005.

Over sample: 400% (40 sites) for a total of 50 sites per stratum and 850 total.

Site Use: Assume the base design has 50 sites. Sites are listed in siteID order and must be used in that order within each stratum. All sites that occur prior to the last site used must have been evaluated for use and then either sampled or reason documented why that site was not used. As an example, if 50 sites are to be sampled and it required that 71 sites be evaluated in order to locate 50 stream sites able to be sampled, then the first 71 sites in siteID order would be used.

Sample Frame Summary

Sample frame area (sq km)

ENP	LOX	WCA2A	WCA3A
1967.1370	568.8468	540.2962	2359.2960

Site Selection Summary

	Number of Sites			
	Fall	OverSamp	Spring	Sum
ENP_2013	21	21	21	63
WCA3A_2013	28	28	28	84
WCA2A_2013	7	7	7	21
LOX_2013	7	7	7	21
ENP_SampFall_2005	21	22	0	43
WCA3A_SampFall_2005	28	27	0	55
WCA2A_SampFall_2005	7	5	0	12
LOX_SampFall_2005	6	3	0	9
Sum	125	120	63	308

Description of Sample Design Output:

The output is provided as a shapefile for the sites. Note that the “.dbf” file may be read in Excel. The attributes are as follows:

Variable Name	Description
siteID	Unique site identification (character)
xcoord	x-coordinate from map projection (see below)
ycoord	y-coordinate from map projection (see below)
mdcaty	Multi-density categories used for unequal probability selection
wgt	Weight (in km), inverse of inclusion probability, to be used in statistical analyses
stratum	Strata used in the survey design
panel	Identifies base sample by panel name and Oversample by OverSamp
Region	Everglade region
SiteID2005	SiteID from 2005 survey design
StoN_id	Region 4 site id
XUTM17ND27	x-coordinate UTM Zone 17, NAD27
YUTM17ND27	y-coordinate UTM Zone 17, NAD27

Projection Information

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PROJCS["NAD_1983_UTM_Zone_17N",
GEOGCS["GCS_North_American_1983",
DATUM["D_North_American_1983",
SPHEROID["GRS_1980",6378137.0,298.257222101]],
PRIMEM["Greenwich",0.0],
UNIT["Degree",0.0174532925199433]],
PROJECTION["Transverse_Mercator"],
PARAMETER["False_Easting",500000.0],
PARAMETER["False_Northing",0.0],
PARAMETER["Central_Meridian",-81.0],
PARAMETER["Scale_Factor",0.9996],
PARAMETER["Latitude_Of_Origin",0.0],
UNIT["Meter",1.0]]

```

Evaluation Process

The survey design weights that are given in the design file assume that the survey design is implemented as designed. Typically, users prefer to replace sites that can not be sampled with other sites to achieve the sample size planned. The site replacement process is described above. When sites are replaced, the survey design weights are no longer correct and must be adjusted. The weight adjustment requires knowing what happened to each site in the base design and the over sample sites. EvalStatus is initially set to "NotEval" to indicate that the site has yet to be evaluated for sampling. When a site is evaluated for sampling, then the EvalStatus for the site must be changed. Recommended codes are:

EvalStatus Code	Name	Meaning
TS	Target Sampled	site is a member of the target population and was sampled
LD	Landowner Denial	landowner denied access to the site
PB	Physical Barrier	physical barrier prevented access to the site
NT	Non-Target	site is not a member of the target population
NN	Not Needed	site is a member of the over sample and was not evaluated for sampling
Other codes		Many times useful to have other codes. For example, rather than use NT, may use specific codes indicating why the site was non-target.

Statistical Analysis

Any statistical analysis of data must incorporate information about the monitoring survey design. In particular, when estimates of characteristics for the entire target population are computed, the statistical analysis must account for any stratification or unequal probability selection in the design. Procedures for doing this are available from the Aquatic Resource Monitoring web page given in the bibliography. A statistical analysis library of functions is available from the web page to do common population estimates in the statistical software environment R.

For further information, contact

Anthony (Tony) R. Olsen
USEPA NHEERL
Western Ecology Division
200 S.W. 35th Street
Corvallis, OR 97333
Voice: (541) 754-4790
Fax: (541) 754-4716
email: Olsen.Tony@epa.gov

Bibliography:

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Web Pages:

Aquatic Resource Monitoring <http://www.epa.gov/nheerl/arm>